PATENT ABSTRACTS OF JAPAN

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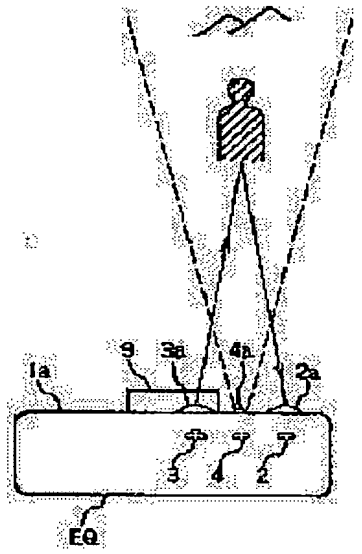
(71)Applicant : SEIKOSHA CO LTD
(72)Inventor : ENDO SHINICHI

(54) CAMERA EQUIPPED WITH PYROELECTRIC INFRARED BEAM SENSOR

(57)Abstract:

PURPOSE: To prevent a photographer from taking a blurred photograph by detecting a human figure, blurring and the limit of blurring and inhibiting photographing when it is judged that it is impossible to disregard the influence.

CONSTITUTION: Light from a position detecting element 2, a near infrared beam projecting element 3 and a sensor 4 installed in a range finder unit are received by a light receiving lens 2a, a projecting lens 3a and a sensor lens 4a mounted on the front side 1a of a housing. Besides, the light received by the sensor 4 is in a far infrared area, and a wavelength interference filter for allowing the light only in the far infrared area to pass through it is mounted on a sensor lens 4a. Whether or not the human figure exists in a viewing angle is decided by the output from the sensor 4, and in the case that the human figure exists and also the blurring is generated, an alarm LED is lighted so as to inform the photographer that photographing is impossible because of blurring. Photographing is inhibited in the case that the object is the human figure and also the blurring is generated in such a way, thus, the human figure can be sharply photographed.



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CLAIMS

[Claim(s)]

[Claim 1] A camera with a pyro infrared sensor characterized by having a pyro infrared sensor which outputs a body detection signal arranged towards a photographic subject, a detection means to detect Bure of a camera, and a photography inhibiting-signal generating means to forbid photography when an output of said pyro infrared sensor and an output of said detection means are obtained.

[Claim 2] A camera with a pyro infrared sensor characterized by providing the following. A pyro infrared sensor which outputs a body detection signal arranged towards a photographic subject A detection means to measure photographic subject brightness and to output a threshold value signal A fill-in flash floodlighting means to floodlight a fill-in flash towards a photographic subject A bloodshot-eyes prevention light floodlighting means to floodlight bloodshot-eyes prevention light which eases a bloodshot-eyes phenomenon of a photographic subject before said fill-in flash, and a floodlighting signal generation means whose floodlighting of said bloodshot-eyes prevention light floodlighting means is enabled when an output of said pyro infrared sensor and an output of said detection means are obtained

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[Translation done.]

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to a camera with a pyroelectric infrared sensor which is photoed while preventing a bloodshot-eyes phenomenon vividly using a pyro infrared sensor, when the photographic subject of the body etc. is photoed.

[0002]

[Description of the Prior Art] With the conventional camera with a pyroelectric sensor, the infrared radiation which a photographic subject emits is detected as indicated by JP,4-38080,A, for example, and it focuses to the photographic subject, and exposure actuation is performed.

[0003]

[Problem(s) to be Solved by the Invention] However, since the effect of Bure is not taken into consideration, even if the conventional camera focuses to target person and animal with much trouble, it will become the photograph which faded for Bure in cases, like the time of an exposure second is long. Moreover, if a stroboscope is made to only emit light and this problem is avoided, the so-called bloodshot-eyes phenomenon by stroboscope luminescence arises, and it is not desirable to person photography.

[0004] With the camera with a pyro infrared sensor of this invention, the body, and Bure and its limit are detected, and when it is judged that the effect cannot be disregarded, it aims at preventing a bloodshot-eyes phenomenon, having photography, while emitting light in prohibition or a stroboscope, and acquiring a photograph with little effect of Bure.

[0005]

[Means for Solving the Problem] In order to solve the above technical problem, with a camera with a pyroelectric sensor of this invention, it has a pyro infrared sensor which outputs a body detection signal arranged towards a photographic subject, a detection means to detect Bure of a camera, and a photography inhibiting-signal generating means to forbid photography when an output of said pyro infrared sensor and an output of said detection means are obtained.

[0006] Moreover, a pyro infrared sensor which outputs a body detection signal arranged towards a photographic subject, A detection means to measure photographic subject brightness and to output a threshold value signal, and a fill-in flash floodlighting means to floodlight a fill-in flash towards a photographic subject, When a bloodshot-eyes prevention light floodlighting means to floodlight bloodshot-eyes prevention light which eases a bloodshot-eyes phenomenon of a photographic subject

before said fill-in flash, an ou[redacted]of said pyro infrared sensor, and an ou[redacted] of said detection means are obtained, it has a floodlighting signal generation means whose floodlighting of said bloodshot-eyes prevention light floodlighting means is enabled.

[0007]

[Function] In advance of exposure actuation, a pyro infrared sensor detects a person, and photography is forbidden, when Bure is detected and both detecting signals are further outputted by the detection means.

[0008] Moreover, in advance of exposure actuation, a pyro infrared sensor detects a person, when a photographic subject brightness limit is detected and both detecting signals are further outputted by the detection means, Puri luminescence of the stroboscope is carried out, and exposure actuation which includes stroboscope luminescence after that is performed.

[0009]

[Example] One example of the camera with a pyro infrared sensor in this invention is explained according to drawing 1 - drawing 4 . The camera with a pyro infrared sensor by this invention prepares light-receiving lens 2a, floodlighting lens 3a, and sensor lens 4a in front-face of case 1a of Case EQ, as shown in drawing 1 . Light-receiving lens 2of front-face of case 1a a, floodlighting lens 3a, and sensor lens 4a send and receive the light of the location sensing element (it is called Following PSD) 2 prepared in the ranging unit 1, the near-infrared floodlighting element (it is called Following IRED) 3, and a sensor 4, as shown in drawing 2 . In addition, the light which a sensor 4 receives is a far infrared region, and the wavelength interference filter which only the light of this far infrared region can pass is covered over sensor lens 4a.

[0010] PSD2, IRED3, and a sensor 4 are connected with the integrated circuit 5 for ranging (it is called Following AFIC), a sensor IC 7, and the IRED drive circuit 6, and the PSD distance signal f1 outputted from PSD2 and the sensor distance signal f2 outputted from a sensor 4 are sent out to a microprocessor (it is called Following CPU) 10. Similarly all the programs that the random access memory 18 in CPU10 (it is called Following RAM) is used for count or temporary storage, and relate to actuation of a camera are built in the read only memory 19 in CPU10 (henceforth a ranging analysis program). In addition, a sensor 4 is the so-called type-of-fever infrared sensor which outputs detection and a signal for change of the infrared radiation which a person emits here. Therefore, except for the case where it attaches in a tripod etc., since infrared radiation changes even if the person is standing it still, it is detectable with a slight motion of the main part of a camera at the time of turning to a photographic subject for photography. Moreover, even if the camera is being fixed, if a person displaces, it is detectable similarly.

[0011] The IRED drive circuit 6 operates by control of CPU10. Moreover, taking-lens 9a of a camera cone 9 operates through the camera cone drive circuit 8 by control of CPU10. A detector 11 detects Bure of Case EQ, changes him into an electrical signal, and is outputted to CPU10. Usually, it is the same as that of what is used for the gravimeter etc. The stroboscope drive circuit 12 performs the charge initiation, a halt, and luminescence for making a stroboscope 13 emit light according to the control signal from CPU10. S1 and S2 are the switches which carry out sequential ON according to press of a well-known non-illustrated release carbon button, and if a photography person pushes a release carbon button, and S1 will turn on first and will push in continuously, they have two-step structure which S2 turns on.

[0012] Actuation of this camera is explained according to the flow chart of drawing 3 . If a well-known non-illustrated release switch is first pushed in the condition of ON of the power supply of a camera, S1 will turn on and it will go into the subroutine of exposure actuation. The strength of the light is first

performed ranging and [redacted] measured continuously in the r[redacted]g unit 1 in a well-known non-illustrated photometry circuit (S02), and it judges whether there is any person in a field angle with the output from a sensor 4 further (S03). If it judged whether Bure would be produced or not (S04) and Bure has arisen when judged with as a result there being a person in a field angle, a transistor 14 will be turned on, warning LED 15 will be turned on, a photography person is told about the ability not to take a photograph because of Bure (S05), and it escapes from this routine. If it is checked that there is no person in a field angle by S02, or Bure has not arisen in S04, the condition of S1 will be detected again (S05), and it will escape from this routine, without exposing, if S1 is not pushed. If the condition of S2 is detected (S06) and it is pushed, and S1 is pushed and it is not pushed [exposure actuation is performed (S07) and], it returns to S06 once again. The subroutine of exposure actuation is ended above.

[0013] When there is a possibility that there may be a person in a field angle and Bure may arise with a luminance signal as other examples of this invention, in advance of the fill-in flash floodlighting at the time of exposure, light is emitted in a fill-in flash for bloodshot-eyes prevention which eases bloodshot eyes compulsorily.

[0014] Actuation of the camera in this example is explained according to the flow chart of drawing 4 . If a well-known non-illustrated release switch is first pushed in the condition of ON of the power supply of a camera, S1 will turn on and it will go into the subroutine of exposure actuation. The luminescence flag fs and the person flag fp which were first assigned to the predetermined field in RAM18 are cleared to 0 (S11). Then, ranging is performed (S12), and the strength of the light is measured continuously in a well-known non-illustrated photometry circuit (S13), and it judges whether there is any person in a field angle with the output from a sensor 4 further (S14). When judged with as a result there being a person in a field angle, the person flag fp is set to 1 (S15). Next, if the brightness of a photographic subject is brightness (for example, Ev<=6) which Bure produces (S16), the luminescence flag fs will be set to 1 (S17). And the condition of S1 is detected again (S18), and it escapes from this routine, without exposing, if S1 is not pushed. If S1 is pushed, and the condition of S2 is detected (S19), it is pushed and the luminescence flag fs will become zero with reference to the value of the luminescence flag fs (S20), exposure actuation will be performed immediately (S21) and the subroutine of exposure actuation will be ended. If the luminescence flag fs becomes one and the person flag fp will become one with reference to the value of the person flag fp (S22), in advance of exposure actuation, will carry out Puri luminescence of the stroboscope 13, will ease a bloodshot-eyes phenomenon (S23), and perform exposure actuation continuously, a stroboscope 13 is made to emit light to that intermediate suitable timing (S24), and it escapes from this routine. In addition, it is not judged with there being a person, but when there is a possibility that Bure may arise with a luminance signal, it can be understood from the flow chart of drawing 4 that exposure actuation by stroboscope light is performed without Puri luminescence.

[0015] Although the distance measuring equipment of this invention explained the case of the single AF of the so-called active guidance which consists of a single floodlighting element and a single photo detector, respectively, it may consist of so-called multi-AF which consists of two or more floodlighting elements and photo detectors. Moreover, you may constitute from so-called distance measuring equipment of the passive guidance ranged only using the light from a photographic subject.

[0016] It is moreover, like [although this invention has realized bloodshot-eyes prevention in the form of Puri luminescence of a fill-in flash] the high brightness light emitting diode formed independently of the source of a fill-in flash.

[0017] Moreover, although th[redacted]o infrared sensor of this invention is a [redacted]e-of-fever infrared sensor, it cannot necessarily be restricted to this, and can use the infrared sensor of other molds, or can photograph other operation gestalten in the range of the concept of this invention.

[0018]

[Effect of the Invention] A photographic subject is a person, and since the camera with a pyro infrared sensor of this invention forbids photography when Bure has arisen, it can photo a person vividly, so that clearly also from the above explanation.

[0019] Moreover, a photographic subject is a person, and since exposure actuation by the stroboscope light accompanied by Puri luminescence is performed when exceeding a limit with a possibility that Bure may arise, vividly, a bloodshot-eyes phenomenon can be eased and a person can be photoed.

[Translation done.]

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is principle drawing of the example of this invention.

[Drawing 2] It is the block diagram of the camera of the example of this invention.

[Drawing 3] It is the flow chart of the example of this invention.

[Drawing 4] It is the flow chart of other examples of this invention.

[Description of Notations]

4 Sensor

11 Detector

S05 Warning step

[Translation done.]

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審査請求　未請求　請求項の数２　ＯＬ　（全 6 頁）

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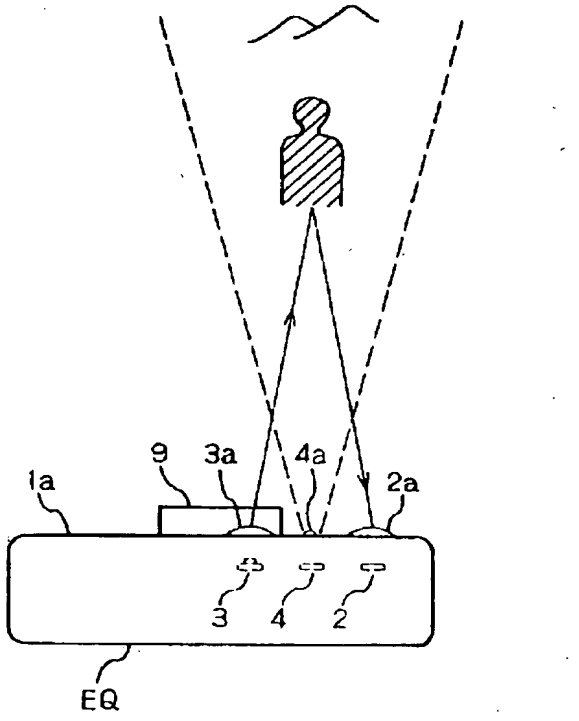
(71)出願人　000002381
株式会社精工舎
東京都中央区京橋２丁目６番21号
(72)発明者　遠藤　慎一
千葉県四街道市鹿渡934－13番地　株式会社精工舎千葉事業所内
(74)代理人　弁理士　松田　和子

(54)【発明の名称】　焦電型赤外線センサ付カメラ

(57)【要約】

【構成】　露出作動に先だって焦電型赤外線センサによって人物を検出し、さらにブレ検出手段によってブレを検出し、共に検出信号が出力された場合には撮影を禁止するか、またはストロボをプリ発光し、その後にストロボ発光を含む露出作動を行う。

【効果】　被写体が人物であり、かつブレが生じている場合には撮影を禁止あるいはプリ発光を含めてストロボを発光するので、人物を鮮明に、しかも赤目現象を緩和して撮影することができる。



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【特許請求の範囲】

【請求項１】　被写体に向けて配設された人体検知信号を出力する焦電型赤外線センサと、カメラのブレを検出する検出手段と、前記焦電型赤外線センサの出力および前記検出手段の出力が得られたとき撮影を禁止する撮影禁止信号発生手段とを備えたことを特徴とする焦電型赤外線センサ付カメラ。

【請求項２】　被写体に向けて配設された人体検知信号を出力する焦電型赤外線センサと、被写体輝度を測定して限界値信号を出力する検出手段と、被写体に向けて補助光を投光する補助光投光手段と、前記補助光に先だつ被写体の赤目現象を緩和する赤目防止光を投光する赤目防止光投光手段と、前記焦電型赤外線センサの出力および前記検出手段の出力が得られたとき、前記赤目防止光投光手段を投光可能にする投光信号発生手段とを備えたことを特徴とする焦電型赤外線センサ付カメラ。

【発明の詳細な説明】

【０００１】

【産業上の利用分野】本発明は焦電型赤外線センサを用いて、人体などの被写体が撮影される場合に鮮明にかつ赤目現象を防止しながら撮影するような焦電型赤外線センサ付カメラに関する。

【０００２】

【従来の技術】従来の焦電型センサつきカメラでは、たとえば特開平４－３８０８０号公報に開示されているように被写体の発する赤外線を検出し、その被写体に対して合焦し露出作動が行われる。

【０００３】

【発明が解決しようとする課題】ところが従来のカメラはブレの影響が考慮されていないため、せっかく目標とする人物や動物に合焦しても、露出秒時が長いなどの場合にはブレのためにぼけた写真になってしまう。また単にストロボを発光させてこの問題を回避すると、ストロボ発光によるいわゆる赤目現象が生じて人物撮影には好ましくない。

【０００４】本発明の焦電型赤外線センサ付カメラでは、人体と、ブレおよびその限界を検出し、その影響が無視できないと判断される場合には撮影を禁止またはストロボを発光するとともに赤目現象を防止し、もってブレの影響の少ない写真を得ることを目的とする

【０００５】

【課題を解決するための手段】以上の課題を解決するため、本発明の焦電型センサ付カメラでは、被写体に向けて配設された人体検知信号を出力する焦電型赤外線センサと、カメラのブレを検出する検出手段と、前記焦電型赤外線センサの出力および前記検出手段の出力が得られたとき撮影を禁止する撮影禁止信号発生手段とを備えている。

【０００６】また、被写体に向けて配設された人体検知信号を出力する焦電型赤外線センサと、被写体輝度を測定して限界値信号を出力する検出手段と、被写体に向けて補助光を投光する補助光投光手段と、前記補助光に先だつ被写体の赤目現象を緩和する赤目防止光を投光する赤目防止光投光手段と、前記焦電型赤外線センサの出力および前記検出手段の出力が得られたとき、前記赤目防止光投光手段を投光可能にする投光信号発生手段とを備えている。

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【０００７】

【作用】露出作動に先だって焦電型赤外線センサによって人物を検出し、さらに検出手段によってブレを検出し、共に検出信号が出力された場合には撮影を禁止する。

【０００８】また、露出作動に先だって焦電型赤外線センサによって人物を検出し、さらに検出手段によって被写体輝度限界を検出し、共に検出信号が出力された場合にはストロボをプリ発光し、その後にストロボ発光を含む露出作動を行う。

【０００９】

【実施例】本発明における焦電型赤外線センサ付カメラの一実施例を図１～図４に従って説明する。本発明による焦電型赤外線センサ付カメラは図１に示すように筐体ＥＱの筐体前面１ａに受光レンズ２ａ、投光レンズ３ａおよびセンサレンズ４ａを設ける。筐体前面１ａの受光レンズ２ａ、投光レンズ３ａおよびセンサレンズ４ａは図２に示すように、測距ユニット１に設けた位置検出素子（以下ＰＳＤという）２、近赤外投光素子（以下ＩＲＥＤという）３、センサ４の光を送受する。なおセンサ４が受光する光は遠赤外領域で、センサレンズ４ａにはこの遠赤外領域の光だけが通過できるような波長干渉フィルタがかけられている。

【００１０】ＰＳＤ２、ＩＲＥＤ３、センサ４は測距用集積回路（以下ＡＦＩＣという）５、センサＩＣ７およびＩＲＥＤ駆動回路６と接続され、ＰＳＤ２から出力されるＰＳＤ距離信号ｆ１とセンサ４から出力されるセンサ距離信号ｆ２は、マイクロプロセッサ（以下ＣＰＵという）１０へ送出される。計算や一時的な記憶にはＣＰＵ１０内のランダム・アクセス・メモリ（以下ＲＡＭという）１８が使用され、またカメラの動作に係るすべてのプログラムは同じくＣＰＵ１０内のリード・オンリ・メモリ（以下測距分析プログラムという）１９に内蔵されている。なおここではセンサ４は人物が放射する赤外線の変化を検知および信号を出力するいわゆる熱型赤外線センサである。従って三脚などに取り付けた場合を除き、撮影のために被写体に向けた際のカメラ本体のわずかな動きにより、人物が静止していても赤外線が変化するため検知することができる。またカメラが固定されていても、人物が変位すると同様に検知できる。

【００１１】ＩＲＥＤ駆動回路６はＣＰＵ１０の制御で作動するほか鏡胴９の撮影レンズ９ａはＣＰＵ１０の制御で鏡胴駆動回路８を介して作動する。検出回路１１

は筐体ＥＱのブレを検出して電気信号に変換しＣＰＵ１０に出力する。通常重力計などに使われているものと同一である。ストロボ駆動回路１２はＣＰＵ１０からの制御信号に従ってストロボ１３を発光させるための充電開始・停止および発光を行う。Ｓ１とＳ２は不図示の公知のレリーズボタンの押圧に従って順次オンするスイッチで、撮影者がレリーズボタンを押すとＳ１がまずオンし、続いて押し込むとＳ２がオンする２段構造になっている。

【００１２】このカメラの動作を図３のフローチャートに従って説明する。まずカメラの電源がオンの状態で不図示の公知のレリーズスイッチが押されるとＳ１がオンし露出作動のサブルーチンに入る。まず最初に測距ユニット１で測距を行い（Ｓ０１）、続いて不図示の公知の測光回路で測光を行い（Ｓ０２）、さらにセンサ４からの出力により画角内に人物がいるかどうかを判定する（Ｓ０３）。その結果画角内に人物がいると判定された場合はブレの生じているかどうかを判定し（Ｓ０４）、ブレが生じていればトランジスタ１４をオンして警告ＬＥＤ１５を点灯し、ブレのために撮影できないことを撮影者に知らせ（Ｓ０５）、このルーチンを抜ける。Ｓ０２で画角内に人物がいないかまたはＳ０４でブレが生じていないことが確認されると、再びＳ１の状態を検出し（Ｓ０５）、Ｓ１が押されていなければ露出を行わずにこのルーチンを抜ける。Ｓ１が押されていればＳ２の状態を検出し（Ｓ０６）、押されていれば露出作動を行い（Ｓ０７）、押されていなければもう一度Ｓ０６に戻る。以上で露出作動のサブルーチンを終了する。

【００１３】本発明の他の実施例として、人物が画角内にいてかつ輝度信号によりブレが生じる恐れがある場合に、露光時の補助光投光に先だって、強制的に赤目を緩和するような赤目防止用の補助光を発光する。

【００１４】この実施例でのカメラの動作を図４のフローチャートに従って説明する。まずカメラの電源がオンの状態で不図示の公知のレリーズスイッチが押されるとＳ１がオンし露出作動のサブルーチンに入る。まず最初にＲＡＭ１８内の所定の領域に割り当てられた発光フラグｆｓおよび人物フラグｆｐを０にクリアする（Ｓ１１）。続いて測距を行い（Ｓ１２）、続いて不図示の公知の測光回路で測光を行い（Ｓ１３）、さらにセンサ４からの出力により画角内に人物がいるかどうかを判定する（Ｓ１４）。その結果画角内に人物がいると判定された場合は、人物フラグｆｐを１にする（Ｓ１５）。次に被写体の輝度がブレの生じる輝度（たとえばＥｖ≦６）であれば（Ｓ１６）、発光フラグｆｓを１にする（Ｓ１７）。そして再びＳ１の状態を検出し（Ｓ１８）、Ｓ１

が押されていなければ露出を行わずにこのルーチンを抜ける。Ｓ１が押されていればＳ２の状態を検出し（Ｓ１９）、押されていれば発光フラグｆｓの値を参照し（Ｓ２０）、発光フラグｆｓが０ならば直ちに露出作動を行い（Ｓ２１）、露出作動のサブルーチンを終了する。発光フラグｆｓが１ならば人物フラグｆｐの値を参照し（Ｓ２２）、人物フラグｆｐが１ならば露出作動に先だってストロボ１３をプリ発光して赤目現象を緩和し（Ｓ２３）、続いて露出作動を行い、その途中の適切なタイミングでストロボ１３を発光させ（Ｓ２４）、このルーチンを抜ける。なお人物がいると判定されず、輝度信号によりブレが生じる恐れがある場合には、プリ発光なくストロボ光による露出動作が行われることは図４のフローチャートから理解できる。

【００１５】本発明の測距装置はそれぞれ単一の投光素子および受光素子からなる、いわゆるアクティブ式のシングルＡＦの場合について説明したが、複数の投光素子および受光素子からなるいわゆるマルチＡＦで構成してもよい。また被写体からの光のみを用いて測距するいわゆるパッシブ式の測距装置で構成してもよい。

【００１６】また、本発明では補助光のプリ発光という形で赤目防止を実現しているが、補助光源とは独立に設けられた高輝度発光ダイオードのようなものでもよい。

【００１７】また、本発明の焦電型赤外線センサは熱型赤外線センサであるが、必ずしもこれに限るものではなく、他の型の赤外線センサを使用し、または本発明の概念の範囲で他の実施形態を撮ることができる。

【００１８】

【発明の効果】以上の説明からも明らかなように、本発明の焦電型赤外線センサ付カメラは、被写体が人物であり、かつブレが生じている場合には撮影を禁止するので、人物を鮮明に撮影することができる。

【００１９】また、被写体が人物であり、かつブレが生じる恐れのある限界を超える場合にプリ発光を伴ったストロボ光による露出作動を行うので、人物を鮮明に、しかも赤目現象を緩和して撮影することができる。

【図面の簡単な説明】

【図１】本発明の実施例の原理図である。

【図２】本発明の実施例のカメラのブロック図である。

【図３】本発明の実施例のフローチャートである。

【図４】本発明の他の実施例のフローチャートである。

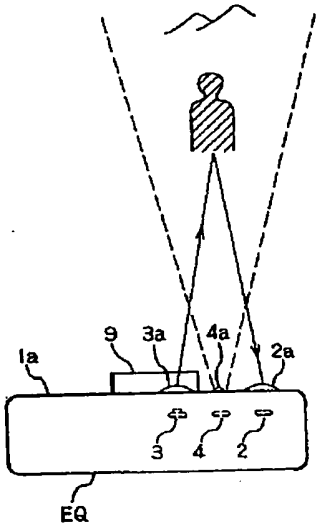
【符号の説明】

４　センサ

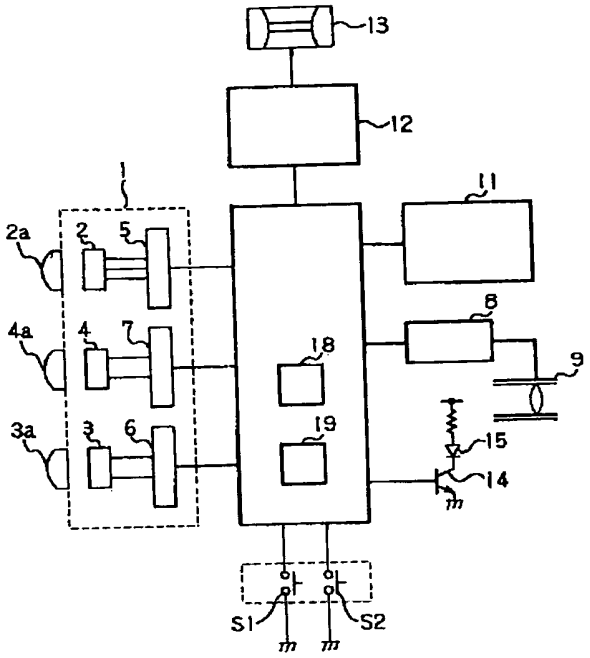
１１　検出回路

Ｓ０５　警告ステップ

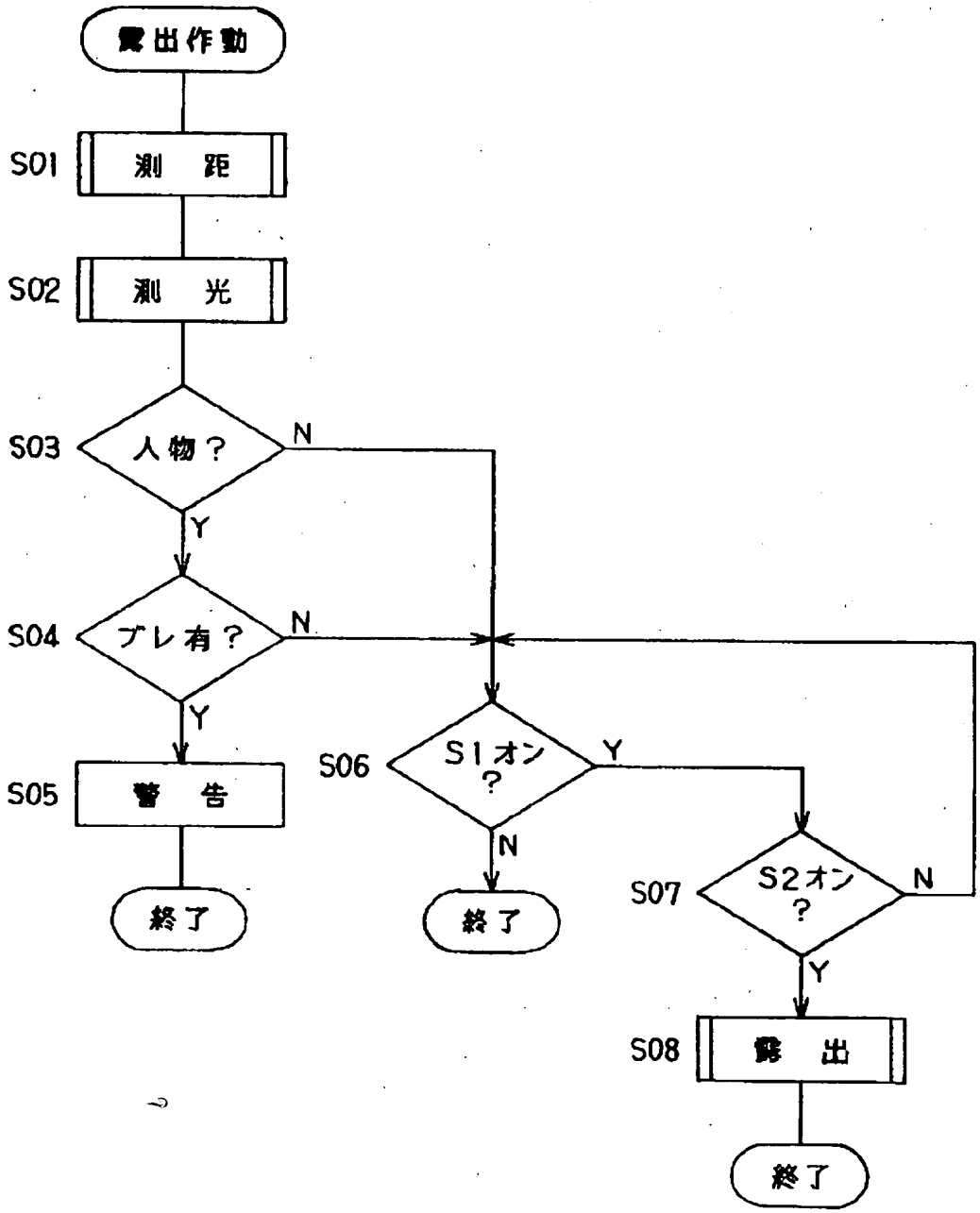
【図１】



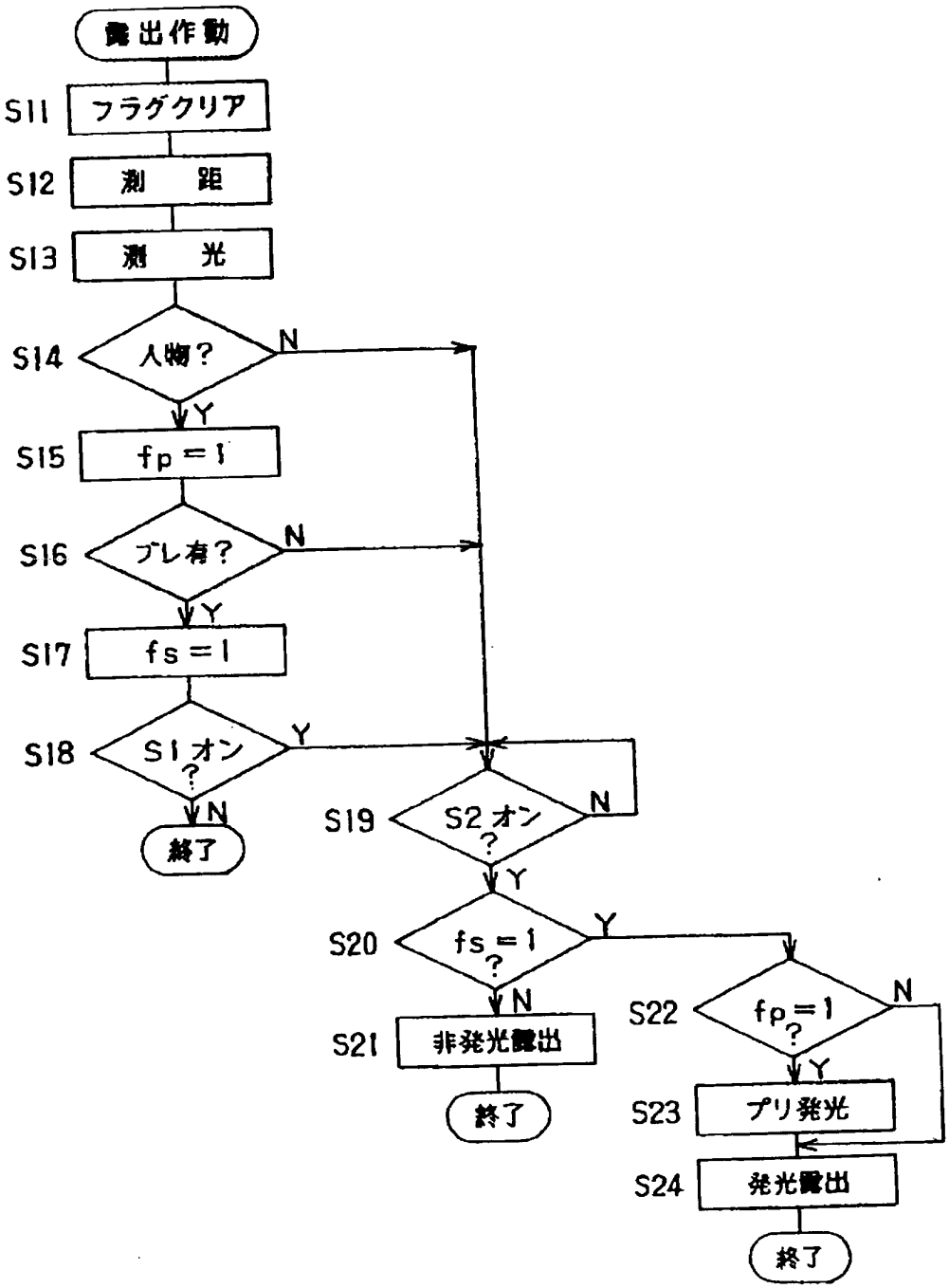
【図２】



【図3】


露出作動
S01
測　距
S02
測　光
S03
人物？
N
Y
S04
ブレ有？
N
Y
S05
警　告
終了
S06
S1オン？
Y
N
終了
S07
S2オン？
N
Y
S08
露　出
終了

【図4】


露出作動
S11
フラグクリア
S12
測　距
S13
測　光
S14
人物？
N
Y
S15
fp＝1
S16
ブレ有？
N
Y
S17
fs＝1
S18
S1オン？
Y
N
終了
S19
S2オン？
N
Y
S20
fs＝1？
Y
N
S21
非発光露出
終了
S22
fp＝1？
N
Y
S23
プリ発光
S24
発光露出
終了

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